

CLAIMS

1. A hand portable device comprising:  
a user input device comprising a plurality of sensors for tactile actuation by a user including a first sensor and a second sensor adjacent thereto; and  
control means responsive to the actuation of the first sensor by itself to produce a first control signal, responsive to the actuation of the second sensor by itself to produce a second control signal different from the first control signal, and responsive to the simultaneous actuation of the first and second sensors in combination to produce a third control signal different from the first and second control signals.
2. A hand portable device as claimed in claim 1, wherein the plurality of sensors comprises a first set of sensors consisting of a first sensor adjacent a second sensor, constituting a first pair of sensors, and a third sensor adjacent the second sensor, constituting a second pair of sensors; and a second set of sensors consisting of a fourth sensor adjacent a fifth sensor, constituting a third pair of sensors, and a sixth sensor adjacent the fifth sensor, constituting a fourth pair of sensors.
3. A hand portable device as claimed in claim 2 wherein the pairs of sensors are located and arranged to be simultaneously actuated by a user using one digit.
4. A hand portable device as claimed in claim 2 or 3 wherein the first set of sensors is adjacent the second set of sensors.
5. A hand portable device as claimed in 2, 3 or 4, wherein the control means is responsive to user actuation of a respective one of at least four of the six sensors to provide a respective one of four different control signals and is responsive to user actuation of a respective one of the first, second, third and fourth pairs of sensors to provides for a respective one of an additional four different control signals.

6. A hand portable device as claimed in claim 2, 3, 4 or 5, wherein the control means produces:

- (a) a first control signal in response to the actuation of the second sensor;
- (b) a second control signal in response to the actuation of the first sensor;
- (c) a third control signal in response to actuation of both the first and second sensors simultaneously;
- (d) a fourth control signal in response to the actuation of the third sensor;
- (e) a fifth control signal in response to the actuation of both the second and third sensors simultaneously;
- (f) a sixth control signal in response to the actuation of the fifth sensor;
- (g) a seventh control signal in response to the actuation of both the fifth and sixth sensors simultaneously; and
- (h) an eighth control signal in response to the actuation of both the fourth and fifth sensors simultaneously.

7. A hand portable device as claimed in claim 6 wherein the control means in response to the actuation of only the fourth sensor produces the second control signal and in response to actuation of only the sixth sensor produces the fourth control signal.

8. A hand portable device as claimed in any preceding claim wherein the control means comprises detection means for detecting the simultaneous actuation of keys.

9. A hand portable device as claimed in any preceding claim wherein the plurality of sensors is a 2x3 or 3x2 array of sensors.

10. A hand portable device as claimed in any preceding claim when dependent upon claim 2 wherein the user input device is a keypad having first,

second, third, fourth, fifth and sixth keys which respectively actuate the first, second, third, fourth, fifth and sixth sensors whereby the first, second, third and fourth pairs of sensors have corresponding first, second, third and fourth pairs of keys.

11. A hand portable device as claimed in claim 10 wherein each pair of keys are located and arranged to be simultaneously actuated by a user using one digit.

12. A hand portable device as claimed in claim 10 or 11 wherein the pairs of keys are located and arranged to be actuated by a user rolling or pivoting one digit.

13. A hand portable device as claimed in any one of claims 10 to 12, wherein the first, second and third keys are arranged curvilinearly.

14. A hand portable device as claimed in any one of claims 10 to 12, wherein the first, second and third keys are arranged rectilinearly.

15. A hand portable device as claimed in any one of claims 10 to 14 wherein the fourth, fifth and sixth keys are arranged substantially parallel to the first, second and third keys.

16. A hand portable device as claimed in any one of claims 10 to 15, wherein the first, second, third, fourth, fifth and sixth keys form an array.

17. A hand portable device as claimed in any preceding claim wherein the first, second, third, fourth, fifth and sixth keys occupy an area not significantly exceeding 20 mm by 15 mm.

18. A hand portable device as claimed in any one of claims 10 to 17 wherein the keypad comprises a 4x3 array of mobile telephone keys.

19. A hand portable device as claimed in any one of claims 10 to 17 wherein the keypad is a typist's keypad.

20. A hand portable device as claimed in any one of claims 10 to 19 having a data entry mode where the keypad including the plurality of keys are used to enter data wherein in said data entry mode the control means is responsive to the actuation of the first key and second key separately but not together to produce different control signals.

21. A hand portable device as claimed in any preceding claim further comprising a display for displaying an image including an element moving in the display, wherein the first control signal causes the element to move in a first direction, the second control signal causes the element to move in a second direction and the third control signal causes the element to move in a third direction intermediate of the first and second directions.

22. A hand portable device as claimed in any one of claims 1 to 20 further comprising a display for displaying an image having a perspective dependent upon a notional viewing position, wherein the first control signal causes the notional viewing position to move in a first direction, the second control signal causes the notional viewing position to move in a second direction and the third control signal causes the notional viewing position to move in a third direction intermediate of the first and second directions.

23. A method of providing directional control, using the sensors of a keypad of a hand portable device, comprising the steps of:

- simultaneously sensing an input from each one of a plurality of sensors;
- associating predetermined control signals with predetermined combinations of simultaneous inputs;

- detecting simultaneous combinations of inputs to produce a first control signal in response to the actuation of a first sensor by itself, to produce a second control signal in response to actuation of a second sensor by itself, and to produce a third control signal in response to actuation of the first sensor and

the second sensor together.

24. A user input device for providing 8-way directional control, comprising a first set of sensors consisting of a first sensor adjacent a second sensor, constituting a first pair of sensors, and a third sensor adjacent the second sensor, constituting a second pair of sensors; and a second set of sensors, adjacent the second set of sensors, consisting of a fourth sensor adjacent a fifth sensor, constituting a third pair of sensors, and a sixth sensor adjacent the fifth sensor, constituting a fourth pair of sensors; wherein user actuation of a respective one of at least four of the six sensors provides for control in a respective one of four different directions and user actuation of a respective one of the first, second, third and fourth pairs of sensors provides for control in a respective one of the remaining four different directions.

25. A user input device as claimed in claim 24, wherein the pairs of sensors are located and arranged to be simultaneously actuated by a user using one digit.

26. A user input device as claimed in claim 24 or 25, wherein the plurality of sensors is a 2x3 or 3x2 array of sensors.

27. A user input device as claimed in claim 24, 25 or 26, comprising a keypad having first, second, third, fourth, fifth and sixth keys which respectively actuate the first, second, third, fourth, fifth and sixth sensors whereby the first, second, third and fourth pairs of sensors have corresponding first, second, third and fourth pairs of keys.

28. A user input device as claimed in claim 27 wherein each pair of keys are located and arranged to be simultaneously actuated by a user using one digit.

29. A user input device as claimed in claim 27 or 28 wherein the pairs of

keys are located and arranged to be actuated by a user rolling or pivoting one digit.

30. A user input device as claimed hand portable device as claimed in any one of claims 27 to 29, wherein the first, second and third keys are arranged curvilinearly.

31. A user input device as claimed in any one of claims 27 to 29, wherein the first, second and third keys are arranged rectilinearly.

32. A user input device as claimed in any one of claims 27 to 31 wherein the fourth, fifth and sixth keys are arranged substantially parallel to the first, second and third keys.

33. A user input device as claimed in any one of claims 27 to 29, wherein the first, second, third, fourth, fifth and sixth keys form an array.

34. A user input device as claimed in any one of claims 27 to 33, wherein the first, second, third, fourth, fifth and sixth keys occupy an area not significantly exceeding 20 mm by 15 mm.

35. A user input device as claimed in any one of claims 27 to 34 wherein the keypad comprises a 4x3 array of mobile telephone keys.

36. A user input device as claimed in any one of claims 27 to 34, wherein the keypad is a typist's keypad.

37. A hand portable device comprising a user input device as claimed in any one of claims 24 to 36, and control means, wherein the control means produces:

- (a) a first control signal in response to the actuation of the second sensor;
- (b) a second control signal in response to the actuation of the first sensor;

- (c) a third control signal in response to actuation of both the first and second sensors simultaneously;
- (d) a fourth control signal in response to the actuation of the third sensor;
- (e) a fifth control signal in response to the actuation of both the second and third sensors simultaneously;
- (f) a sixth control signal in response to the actuation of the fifth sensor;
- (g) a seventh control signal in response to the actuation of both the fifth and sixth sensors simultaneously; and
- (h) an eighth control signal in response to the actuation of both the fourth and fifth sensors simultaneously.

38. A hand portable device as claimed in claim 37 wherein the control means in response to the actuation of only the fourth sensor produces the second control signal and in response to actuation of only the sixth sensor produces the fourth control signal.

39. A hand portable device as claimed in claim 37 or 38, wherein the control means comprises detection means for detecting the simultaneous actuation of keys.

40. A hand portable device as claimed in any one of claims 37 to 39 having a data entry mode where the keypad including the plurality of keys are used to enter data wherein in said data entry mode the control means is responsive to the actuation of the first key and second key separately but not together to produce different control signals.

41. A hand portable device as claimed in any one of claims 37 to 40 further comprising a display for displaying an image including an element moving in the display, wherein the first control signal causes the element to move in a first direction, the second control signal causes the element to move in a second direction and the third control signal causes the element to move in a third

direction intermediate of the first and second directions.

42. A hand portable device as claimed in any one of claims 37 to 40. further comprising a display for displaying an image having a perspective dependent upon a notional viewing position, wherein the first control signal causes the notional viewing position to move in a first direction, the second control signal causes the notional viewing position to move in a second direction and the third control signal causes the notional viewing position to move in a third direction intermediate of the first and second directions.

43. A method of providing 8-way directional control using a user input device comprising a first set of sensors consisting of a first sensor adjacent a second sensor, constituting a first pair of sensors, and a third sensor adjacent the second sensor, constituting a second pair of sensors and a second set of sensors, adjacent the second set of sensors, consisting of a fourth sensor adjacent a fifth sensor, constituting a third pair of sensors, and a sixth sensor adjacent the fifth sensor, constituting a fourth pair of sensors, comprising the steps of:

actuating predetermined ones of the sensors to move in any one of a first four orthogonal directions, and

actuating predetermined ones of the four pairs of the sensors to move in any one of a second four orthogonal directions, off-set by 45 degrees from the first four orthogonal directions.